

City of Rochester, New York
Hemlock Filtration Plant
7412 Rix Hill Rd.
Hemlock, NY 14466

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Working Together to Protect



City of Rochester, New York
William A. Johnson Jr., Mayor

America's Drinking Water



City of Rochester Water Quality Report



**128 Years of Pure and
Wholesome Drinking Water
for the Rochester Area**

Rochester Water & Lighting Bureau
10 Felix St., Rochester, N.Y. 14608
Public Water Supply ID # NY2704518

Questions and Answers About Your Water

Dear Water Customer:

The Rochester Water and Lighting Bureau (RWLB) is pleased to provide by this brochure its 2003 Annual Water Quality Report. The report contains information about the sources of your drinking water and the methods of treatment and storage. It gives a brief review of what work we completed and also what work we plan for future years to insure reliable service. It concludes with a summary of the comprehensive testing that was performed on your water from source to tap.

I am proud to once again be able to state that the water served to your homes and businesses last year met all State and Federal Drinking water requirements. As we move forward in 2004, you have my pledge that we will continue to work hard to deliver pure, wholesome drinking water, and to provide efficient, friendly service, all at an affordable price.

Your feedback is always valuable to us. If you have any questions or comments, about this report please give us a call at 428-6680.

Sincerely,



Donald J. Navor,
Director of Water and Lighting



Where does my water come from?

Since 1876, most Rochesterians have relied upon the watershed system located around Hemlock and Canadice Lakes for their drinking water supply. These lakes lie in the hills of Livingston and Ontario counties, about 30 miles south of Rochester.

The City owns a large portion of the Hemlock/Canadice Lake watershed, including the lakes and their surrounding shorelines, and it is this ownership that allows us to protect the lakes from potential sources of contamination.

The City supplements its water supply with Lake Ontario water purchased from the Monroe County Water Authority (MCWA). This water is treated at the MCWA's Shoremont Treatment Plant on Dewey Avenue (more info at www.MCWA.com).

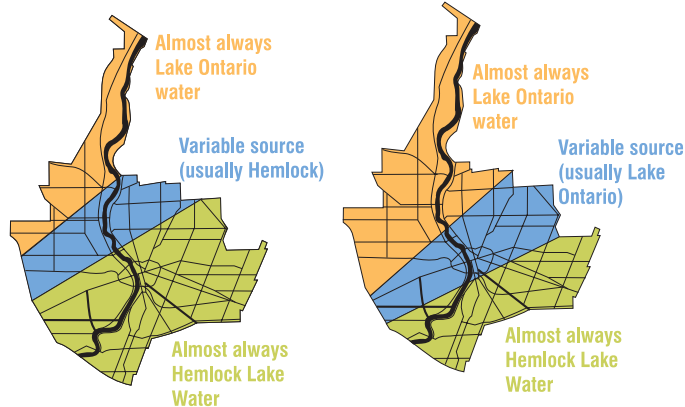
How is my water treated?

The Hemlock Filtration Plant and the Shoremont Treatment Plant employ similar treatment processes involving coagulation, filtration, and disinfection. During coagulation, chemicals are added to untreated water, causing algae, bacteria, and silt in the water to clump together into larger particles called floc. The floc particles are then filtered out by passing the water through layered beds of granular media. In the final steps, the filtered water is disinfected through the addition of chlorine, and fluoride is added to help prevent tooth decay. The water may also be seasonally adjusted for pH. In 2003, the quality of water produced at both the Hemlock and Shoremont treatment plants was consistently better than health regulations require.

What happens to the water after treatment?

Water treated at the Hemlock Filtration Plant flows to the city completely by gravity through three, 100 year-old pipelines. Along the way, some water is sold wholesale to water districts in the towns of Livonia, Lima, and North Bloomfield. It is also sold to the MCWA, who in turn supply it to several Monroe County communities including Honeoye Falls/Mendon, Rush, Henrietta, and Brighton.

Winter Distribution Pattern Summer Distribution Pattern



A large volume of treated water is stored in reservoirs located in the Town of Rush, at Cobb's Hill, and in Highland Park. Water is re-disinfected with chlorine as it exits each reservoir.

From the storage reservoirs, water enters a complex grid of water mains known as the distribution system.

Lake Ontario water purchased from MCWA is pumped into the distribution system primarily in the area of Mt. Read Blvd. and West Ridge Rd. The volume of purchase varies from 0 to 30 million gallons per day (MGD), depending on the season. This variability means that some areas of the City may receive either Hemlock or Lake Ontario water, or a mixture of both, depending on the season and the prevailing pattern of demand. The maps above illustrate the typical distribution pattern of the two sources of water during summer and winter conditions.

Is the water system being modernized and how are improvements funded?

The Hemlock Filtration Plant is just 10 years old and is not yet in need of major capital upgrades. However, much of our piping and the storage reservoirs are very old and require substantial capital investment to insure long-term reliability and regulatory compliance. Last year's capital budget for water system improvements totaled \$9.5 million dollars. Capital projects completed or nearly completed in 2003 included modification of a key piece of 60" pipeline near Hemlock Lake, testing of an anti-corrosion system to protect large transmission pipes, replacement of

5.7 miles of water mains within the distribution system, and roadway access and security improvements at Cobb's Hill Reservoir. We performed a comprehensive review of security vulnerabilities, and also completed concept plans for a new Bureau headquarters scheduled for construction in 2005. Two large projects scheduled to begin in 2004 are upgrades to the large transmission pipes that convey water from Hemlock Lake to Rochester, and a comprehensive study to evaluate the future of the reservoir system. Water system improvements are financed through revenue generated by the sale of water and other fees paid by the consumer. Rate increases in recent years have been driven largely by the needs to address improvements and upgrades to the aging water infrastructure.

| INTERESTING WATER SYSTEM FACTS | |
|---|---------|
| Statistics | 2003 |
| Average Daily Production (MG) | 35.64 |
| Average Daily City Consumption (MG) | 26.02 |
| Average Daily Wholesale Sales (MG) | 16.76 |
| Average Daily Wholesale Purchase (MG) | 14.83 |
| Average Daily Lost Water (MG) | 7.69 |
| Cost (\$/1000 gals for 1st 20,000 gals) | 2.29 |
| Population Served | 219,000 |
| Number of Retail Accounts | 61,149 |
| Table Notes: | |
| Lost water is that portion of water put into the system that cannot be accounted for by metered sales or other permitted uses. MG=Millions of gallons | |

Should I try to conserve water?

It is always advisable to use water responsibly. Conservation lowers your bill and helps save the environment in numerous ways. Simple steps like those listed in the box can make a difference. Many water saving tips can be found on internet sites such as this:
www.epa.state.oh.us/ddagw/Documents/saveh2o.pdf

Four Simple Conservation Steps

- *Fix leaky toilets and faucets promptly.*
- *Replace old fixtures with newer, more efficient designs.*
- *Water lawns and fill pools in the evening or early morning hours.*
- *Don't let hoses or faucets run unattended.*

Can I visit the Hemlock watershed and/or tour the water plant?

Thousands of people visit the watershed each year and enjoy activities such as hiking, fishing, hunting, boating, and bird watching. Visitors are required to obtain a free permit that describes usage rules. The permit can be obtained at the self-serve permit station located on Rix Hill Road just off Hwy 15A in Hemlock, or online at www.cityofrochester.gov/watershedpermit.htm. Tours of the Hemlock Water Filtration Plant are available by appointment and can be scheduled by calling 428-6680.

Should I be concerned about chemicals in my water?

We have found no chemical contaminants in our water in levels that raise concern. Please understand that all drinking water, including bottled water, contains at least small amounts of impurities. Their mere presence does not necessarily indicate that water poses a health risk. Some substances, such as chlorine and fluoride are added to the water supply for their health benefits. More information about contaminants and potential health effects can be obtained by calling the EPA Safe Drinking Water Hotline at 1-800-426-4791.

How do contaminants get into the water?

The sources of drinking water (both tap and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and underground aquifers. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals, and in some cases, radioactive material. It can also pick up contaminants that result

from the presence of animals and from human activities. These contaminants may include microbes, inorganic contaminants, pesticides and herbicides, organic chemical contaminants, and radioactive contaminants.

Who is in charge of regulating the quality of drinking water?

New York State and the federal Environmental Protection Agency both prescribe regulations that limit the amounts of contaminants that can be present in water provided by public water systems as well as in bottled waters. A complex web of federal and state drinking water regulations dictate how we monitor, test and report data. The Monroe County Health Department (contact at 274-6057) helps enforce these regulations. You can find detailed information about the State's water supply program at www.health.state.ny.us/nysdoh/water/main.htm and about the EPA program at www.epa.gov/ogwdw/.

Did Rochester comply with all regulatory standards related to drinking water?

Yes. The many thousands of quality tests performed on your drinking water last year showed that it was considerably better than the standards require. We also met all monitoring, testing, and reporting requirements. This annual report fulfills one of our reporting requirements.

What kinds of tests were performed?

More than 130 types of regulated biologic agent and chemical compounds were tested in 2003. Samples were collected from all stages of the system, including the source (streams and lakes), various steps in the treatment process, the storage reservoirs, and from the customer's tap. See the data tables on the other side.

Were *Cryptosporidium* or *Giardia* found in our water?

No. All tests for these microbes in Hemlock Lake and Lake Ontario were negative in 2003. Because the testing techniques are imperfect, experts suggest that

persons who are most vulnerable to diseases caused by these organisms may want to consider taking special precautions even if the water tests negative. Therefore, if you or a loved one are immunocompromised (infants, infirm elderly, persons undergoing chemotherapy, persons who have undergone organ transplants, and people with HIV/AIDS or other immune disorders), you may wish to seek advice from your health care provider regarding drinking water. You can get more information about these and other pathogens by calling the EPA Safe Drinking Water Hotline at 1-800-426-4791, and also by logging on to the following website: www.cdc.gov/ncidod/dpd/healthywater/.

Is there lead in my drinking water?

Our studies continue to show that at-the-tap lead levels in the majority of Rochester households remain within allowable limits (see data table below). It should be noted, however, that in 2003, we did find lead levels in excess of the recommended limit at four of 50 homes tested. The amount of lead in water is largely related to the type of plumbing materials found in individual households, and for this reason, it is possible that lead levels at your home may be higher than at other homes in the community. Infants and young children are typically more vulnerable to lead in drinking water than the general population. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested. You can also help insure that your exposure is minimized by simply allowing the tap to run for a minute or two before use. For more information about lead in drinking water, call the Safe Drinking Water hotline at 1-800-426-4791, or log onto www.epa.gov/safewater/lead/index.html.

Do I need a water softner, or any other type of in-home treatment unit?

As a city water customer, you need not consider any type of in-home water treatment unit unless you have a special desire or circumstantial need. The hardness level of city water is generally considered to be low enough to not require softening. Persons on low sodium diets should also be aware that many softening units replace natural hardness minerals (mostly calcium and magnesium) with sodium. Other types of whole-house and at-the-tap treatment units can be quite effective at removing certain chemical and biological contaminants from water. However, like softeners, these can be expensive to install and maintain, so unless a need is demonstrated, their use may not be justified. Also be aware that, if not maintained properly, some units can produce water of poorer quality than that which flows directly from the tap.

If you are thinking about an in-home treatment unit, we would be glad to discuss your concerns before you purchase (428-6680). If you do decide to purchase, buy from a reputable dealer and maintain the unit according to direction. Information about in-home treatment devices is also available on the National Sanitation Foundation website at: www.nsf.org/consumer/water/index.asp.

How can I find out more about fees and water service related issues?

You may contact a customer service representative (24 hr) at 428-5990. If the representative can not answer your question directly, he or she will put you in touch with someone who can. You can also find more information about Bureau services, fees, and contacts at www.cityofrochester.gov/des/water/rwwlinks.htm.

Detected levels of all substances were well below allowed limits. These test results are mostly for regulated substances detected in the water. A complete list of results for all substances tested in 2003 is available on the City's website www.city-of-rochester.gov (search for *water quality*) or by calling 428-6680.

Inorganic and Radiological Substances

The following substances were detected in water collected at the treatment plant and /or from the water distribution system (customer tap). Not all of these substances are harmful, and in fact, some are purposely added during the treatment process for their health benefits. The substances that are regulated because of health concerns are printed in blue. Data are also included for certain unregulated substances that are often of interest.

| SUBSTANCE | UNITS | MCLG | MCL | HEMLOCK AVERAGE (RANGE) | ONTARIO AVERAGE (RANGE) | TESTED AT | LIKELY SOURCE | MEETS EPA STANDARDS |
|--|----------------|------|-----|-------------------------------|-------------------------------|--------------|---|------------------------|
| Arsenic | µg/L | NS | 10 | 1.6 | ND | WTP | Erosion of natural deposits | YES |
| Barium | mg/L | 2 | 2 | 0.024 | 0.021 (0.020-0.022) | WTP | Erosion of natural deposits | YES |
| Chromium | µg/L | 100 | 100 | 4.3 | ND | WTP | Erosion of natural deposits | YES |
| Chlorine (entry point) | mg/L | NS | 4 | 0.85 (0.1-1.22) | 1.23 (1.0-1.5) | WTP | Disinfectant additive | YES |
| Chlorine (at-the-tap) | mg/L | NA | NA | 0.7 (0-3.5) | NA | DS | Disinfectant additive | NA |
| Fluoride (entry point) | mg/L | NS | 2.2 | 0.88 (0-1.06) | 0.98 (0.2-1.28) | WTP | Water treatment additive to promote dental health | YES |
| Nitrate | mg/L | 10 | 10 | 0.13 (0.04-0.26) | 0.4 (0.38-0.46) | WTP | Fertilizers; erosion of natural deposits; septic tank leachate | YES |
| Selenium | µg/L | 50 | 50 | 3.5 | ND | WTP | Erosion of natural deposits | YES |
| Chloride | mg/L | NS | 250 | 31 (28-33) | 24 (21-26) | WTP | Natural deposits; road salt | YES |
| Color | Color Units | NS | 15 | 3.0 (2.5-5) | ND (ND-3) | WTP | Naturally occurring | YES |
| Hardness (as CaCO ₃) | mg/L grains | NS | NS | 96 5.6 | 125 7 | WTP | Erosion of natural mineral deposits | NA |
| Sodium | mg/L | NS | NS | 16 | 13 | WTP | Natural deposits; road salt; water treatment chemical component | NA |
| Sulfate | mg/L | NS | 250 | 19 (18-19) | 29 | WTP | Natural deposits | YES |

Organic Compounds

Organic, or carbon containing compounds, can be simple or very complex in form. They are found in water in many natural forms, as well as in residues of a wide array of man-made (synthetic) chemicals such as pesticides, solvents, and petroleum products. Thanks to the high quality of our source waters, the levels of most synthetic organic substances in Rochester’s drinking water are too low to measure. However, several organic compounds known as disinfection byproducts (DBP’s) are commonly found at low levels. DBP’s form when natural organic substances react with the disinfectant added during water treatment. Health regulations limit the levels of many synthetic and DBP compounds that can be present in your water. DBP’s were well below current and proposed future levels. A complete list of test results for organic contaminants can be found on the City website (www.city-ofrochester.gov).

| SUBSTANCE | UNITS | MCLG | MCL | HEMLOCK AVERAGE (RANGE) | ONTARIO AVERAGE (RANGE) | LIKELY SOURCE | MEETS EPA STANDARDS |
|-----------------------|-------|------|-----|-------------------------|-------------------------|---------------------------------|---------------------|
| Total Trihalomethane | µg/L | NS | 80 | 37 (13-61) | 32 (19-57) | Byproduct of water chlorination | YES |
| Haloacetic acids | µg/L | NS | 60 | 30 (5-54) | 12 (5-22) | Byproduct of water chlorination | YES |
| Haloacetoneitriles* | µg/L | NS | 50 | 3.9 (1.5-5.3) | 4.4 (3.4-5.5) | Byproduct of water chlorination | YES |
| Haloketones* | µg/L | NS | 50 | 4.5 (1.2-7.6) | 1.8 (0.9-3.4) | Byproduct of water chlorination | YES |
| Chloropicrin* | µg/L | NS | NS | 0.5 (ND-0.8) | ND | Byproduct of water chlorination | NA |
| Chloral hydrate* | µg/L | NS | NS | 8.5 (1.6-13) | 4.6 (1.6-12) | Byproduct of water chlorination | NA |
| Total Organic Halides | µg/L | NS | NS | 34 (22-44) | 101 (54-158) | Byproduct of water chlorination | NA |

* Data marked by asterick from 1998

Turbidity

This is a measure of the clarity of water and it is a key parameter for judging the effectiveness of water filtration. Regulatory compliance is based on “entry point” samples taken at the water treatment plant.

| SUBSTANCE | UNITS | REGULATORY LIMIT | HEMLOCK PLANT | | SHOREMONT PLANT | | LIKELY SOURCE | MEETS EPA STANDARDS |
|-------------------------|-------|------------------------------------|---------------|-----------------------|-----------------|-----------------------|--|---------------------|
| | | | AVERAGE (MAX) | COMPLIANCE W/STANDARD | AVERAGE (MAX) | COMPLIANCE W/STANDARD | | |
| Turbidity (entry point) | NTU | TT=95% of samples must be <0.5 NTU | 0.06 (0.22) | 100% | 0.08 (0.14) | 100% | Erosion of soils through runoff, algae | YES |
| Turbidity (at-the-tap) | NTU | Avg.<5 NTU | 0.20 (2.3) | 100% | 0.14 (0.06-12) | 100% | Algae, corrosion of pipes | YES |

Bacteria and Protozoa

The primary test was for Total Coliform bacteria, a group of bacteria used to indicate the general sanitary conditions in a water system. Most species of this group do not present a health concern, but one species, *E. coli*, can be pathogenic and its confirmed presence is taken seriously. In 1993, the state Health Department granted the City a "biofilm variance," or exception to the Total Coliform MCL. Biofilm is a layer of bacteria that can be found on almost all surfaces, including the inside walls of water pipes. A biofilm variance is only granted where it is shown through testing that the species of coliform bacteria recovered from the water system are harmless environmental strains originating from the pipeline biofilm. The variance does not apply to *E. coli*, or any situation where there is evidence of some external source of contamination. *Cryptosporidium* and *Giardia* are described elsewhere in this report.

| ORGANISM | UNITS | MCLG | MCL | HEMLOCK HIGHEST PRESENCE (AVG. PRESENCE) | ONTARIO HIGHEST PRESENCE (AVG. PRESENCE) | TESTED AT | LIKELY SOURCE | MEETS EPA STANDARDS |
|-----------------------------------|--------------------|------|---|--|--|--------------|--|------------------------|
| Total Coliform bacteria | % monthly presence | 0 | Violation if present in more than 5% of monthly samples | 1.5 (0.4) | NA | DS | Naturally present in soils and in wastes of warm blooded animals | YES |
| <i>E. coli</i> bacteria | presence | 0 | Violation upon any confirmed presence | ND | NA | DS | Wastes of warm blooded animals and humans | YES |
| <i>Cryptosporidium</i> sp. | #/10 L | NS | NS | ND | ND | WTP Raw | Wastes of infected animals and humans | NA |
| <i>Giardia</i> sp. | #/10 L | NS | NS | ND | ND | WTP Raw | Wastes of infected animals and humans | NA |

Copper and Lead

The amount of lead and copper in water is largely related to the types of plumbing materials found in individual households. See comments elsewhere in this report.

| SUBSTANCE | UNITS | REGULATORY GOAL (ALG) | REGULATORY LIMIT (AL) | DISTRIBUTION HOUSEHOLDS | | LIKELY SOURCE | MEETS EPA STANDARD |
|---------------|-------|--------------------------|--------------------------|------------------------------------|--------------------------|--|-----------------------|
| | | | | 90% OF SAMPLES HAD LEVELS BELOW | % OF SAMPLES ABOVE AL | | |
| Copper | mg/L | 1.3 | 1.3 | 0.14 (0.06-0.16) | 0 | Corrosion of pipes & plumbing fixtures | YES |
| Lead | ug/L | 0 | 15 | 10 (ND-55) | 8 | Corrosion of pipes & plumbing fixtures | YES |

The following contaminants were tested for but not detected in 2003:

1,1,1, 2-Tetrachloroethane, 1,1, 1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethene, 1,1- Dichloropropene, EDB, 1,2,3-Trichlorobenzene, 1,2,3-Trichloropropane, 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene, 1,2-Dichloroethane, 1,2-Dichloropropane, 1,3,5, Trimethylbenzene, 1,3-Dichlorobenzene, 1,3-Dichloropropane, 1,3-Dichloropropene(Cis), 1,3-Dichloropropene(Trans), 1,4-Dichlorobenzene, 2,2-Dichloropropane, 2,4 D, 2-4-5 TP, 2-Chlorotoluene, 3-Hydroxycarbofuran, 4,4'-DDT, 4-Chlorotoluene, Aldicarb Sulfone, Aldicarb Sulfoxide, Aldrin, Antimony, Asbestos, Atrazine, Benzene, Benzo(a)pyrene, Beryllium, Bis(2-Ethylhexyl) Phthalate, Bromobenzene, Bromochloromethane, Bromomethane, Butachlor, Cadmium, Carbaryl, Carbofuran, Carbon Tetrachloride, Chlordane, Chlorobenzene, Chloroethane, Chloromethane, cis-1,2-Dichloroethene, Cryptosporidium, Cyanide, DCPA, Dalapon, DBCP, Di(2-Ethylhexyl) Adipate, Dibromomethane, Dicamba, Dichlorodifluoromethane, Dichloromethane (Methylene Chloride), Dieldrin, Dinoseb, Diquat, Endrin, Ethylbenzene, Gross Alpha, Giardia, Gross Beta, Heptachlor, Heptachlorepoxyde, Hexachlorobenzene, Hexachlorobutadiene, Hexachlorocyclopentadiene, Isopropyl Benzene, Lindane, Manganese, Mercury, Methomyl, Methoxychlor, Metolachlor, Metribuzin, Mirex, MTBE, n-Butylbenzene, Nickel, Nitrite, n-Propylbenzene, Oxamyl, PCB's, Pentachlorophenol, Pichloram, p-Isopropyltoluene, Propachlor, sec-Butylbenzene, Silver, Simazine, Styrene, tert-Butylbenzene, Tetrachloroethene, Thallium, Toluene, Toxaphene, trans-1,2-Dichloroethene, Trichloroethene, Trichlorofluoromethane, Vinyl Chloride, Xylene, Zinc.

Definitions of Terms

The following definitions apply to water quality terms used in this brochure.

µg/L *Micrograms per liter*—same as parts per billion (PPB); corresponds to one ounce in 7,812,500 gallons of water.

AL *Action Level*—the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow. For example, special treatment requirements kick-in if lead levels are not below 15 µg/L at 90% or more of sites tested.

ALG *Action Limit Goal*—the level of a contaminant in water below which there is no known or expected health risk, with allowance for a margin of safety.

at-the-tap—distribution system sampling location(s) such as a customer's household tap

DS Distribution System

Entry point—point at which water is introduced to the system following treatment. Identified for regulatory compliance purposes.

L *Liter*—volume of water slightly larger than a quart

MCL *Maximum Contaminant Level*—the highest level of a contaminant allowed in drinking water. MCLs are set as close to the MCLGs as feasible.

MCLG *Maximum Contaminant Level Goal*—the level of a contaminant in drinking water below which there is no known or expected health risk, with allowance for a margin of safety.

mg/L *Milligrams per liter*—same as parts per million (ppm); corresponds to one ounce in 7812.5 gallons of water.

NA *Not Applicable*

ND *Not Detected*

NS *No Standard*—no regulatory standard (MCL or MCLG) in effect.

NTU *Nephelometric Turbidity Unit*—a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

pCi/L *Picocuries per liter*—A measure of the radioactivity of water.

RAW Untreated water

TT *Treatment Technique*—a required process intended to reduce the level of a contaminant in drinking water.

WTP *Water treatment plant*